Jan. 6, 1953 S. B. HARRIS 2,624,312

MAGAZINE PENCIL

Filed Jan. 16, 1950

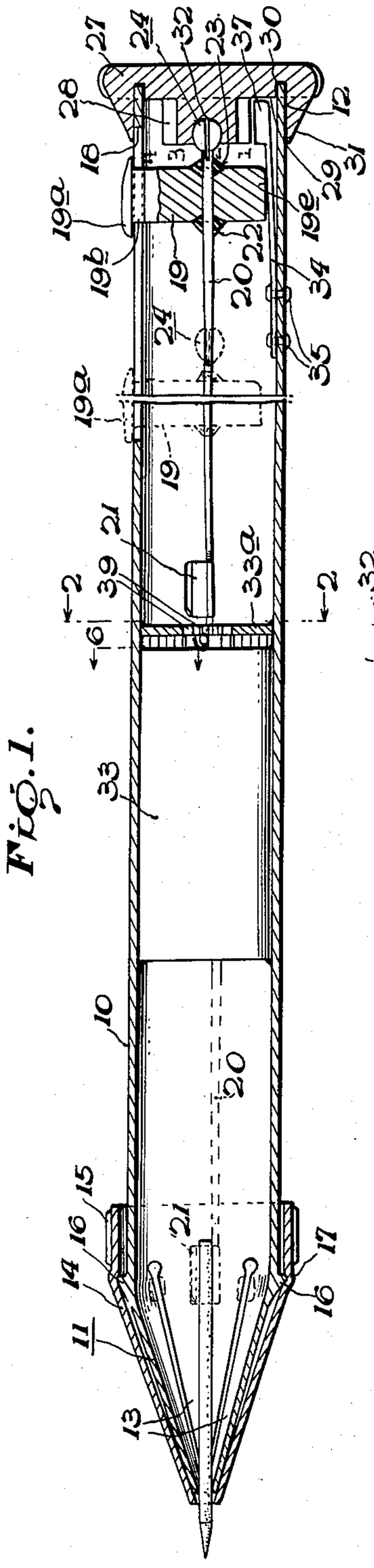

Fig. 1.

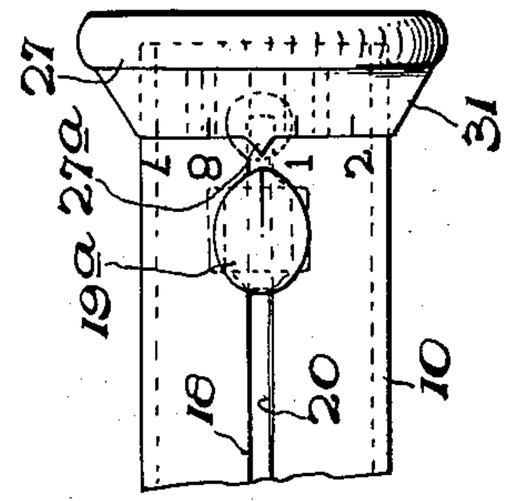

Fig. 3.

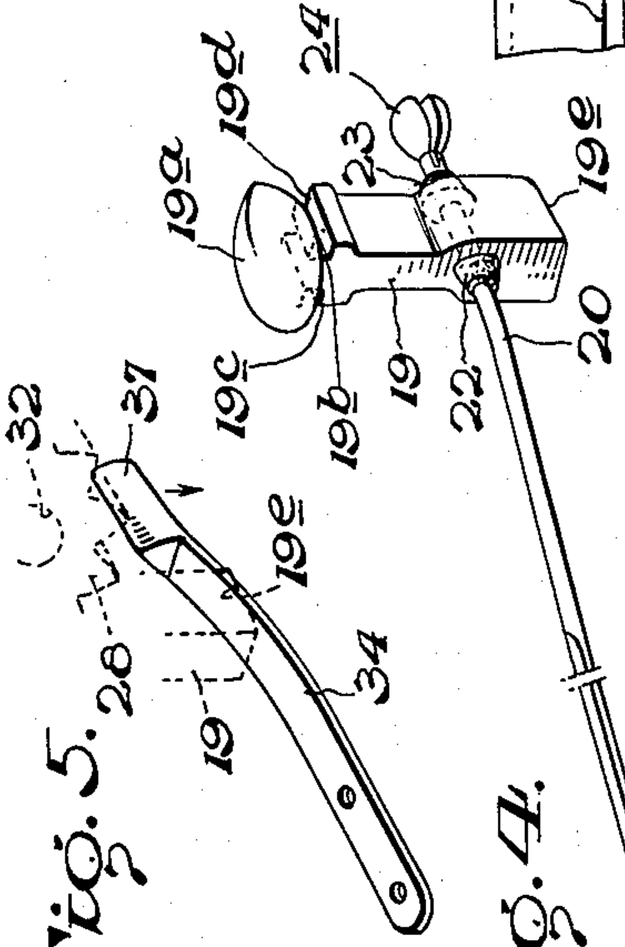

Fig. 5.

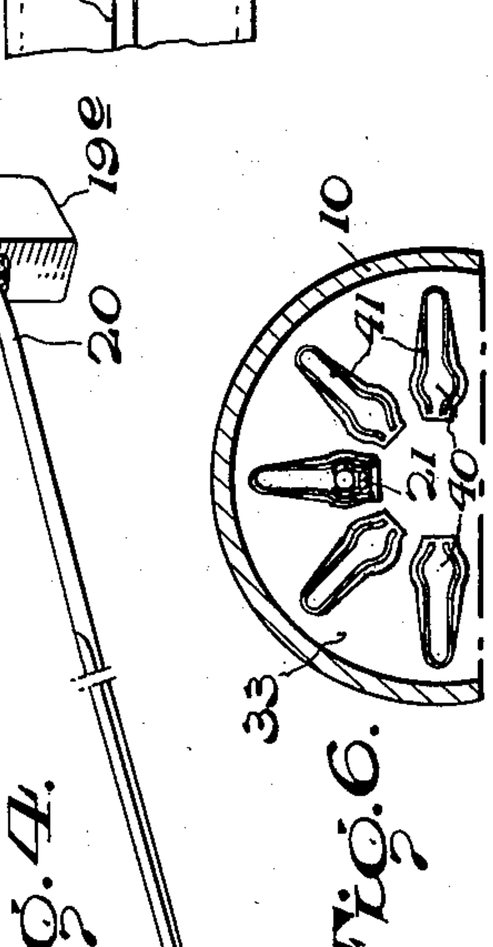

Fig. 4.

Fig. 6.

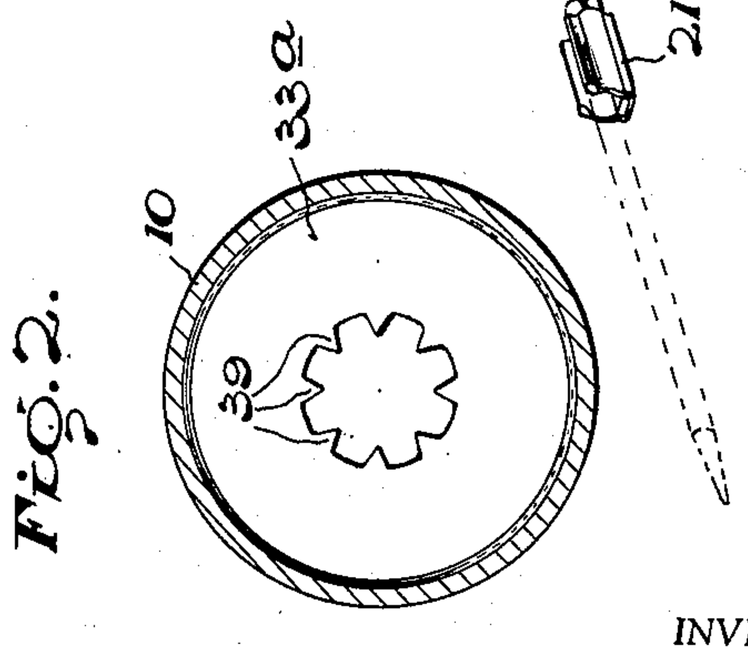

Fig. 2.

INVENTOR

Samuel B. Harris.

BY Herbert M. Birch

ATTORNEY

Patented Jan. 6, 1953

2,624,312

UNITED STATES PATENT OFFICE

2,624,312

MAGAZINE PENCIL

Samuel B. Harris, St. Petersburg, Fla.

Application January 16, 1950, Serial No. 138,814

1 Claim. (Cl. 120—14.3)

1

The present invention is an improvement in magazine pencils and is a continuation in part of my prior co-pending application Serial No. 113,071, filed August 30, 1949, for magazine pencils now Patent 2,561,509.

It is an object of this invention to reduce the number of parts required for selection of the lead from the lead magazine of the pencil to a minimum.

Another object is to combine the lead magazine and pencil barrel as a unit and mount the lead carrier or pick clutch rotatably and axially off center with respect to the bore of the barrel, so as to be turnable by a rotatable selector cap at the top of the pencil.

A further more specific object is to provide an improved latch arrangement for holding a lead selected position of the selector cap and lead pick-up clutch.

The above and further objects and advantages of the present invention will more fully appear from the following detailed description thereof, in which one embodiment is described and illustrated with reference to the accompanying drawings.

In the drawings:

Figure 1 is a longitudinal cross section view of my invention with part of the barrel rod cut away to conserve space.

Figure 2 is a transverse section taken along the line 2—2 of Fig. 1.

Figure 3 is a side elevation of the slot, lug and cap parts of my invention.

Figure 4 is a perspective view of the clutch, its shaft with a slight bend for its connection to the slidable lug as it appears removed from the pencil barrel.

Figure 5 is a perspective view of the spring and wedge-shaped latch for the star wheel carried by the cap.

Figure 6 is a cross section view taken on the line 6—6 across the barrel and lead magazine.

Referring to the drawings, and first with particular reference to Figure 1, there is shown an assembled pencil comprising a hollow barrel 10 having a tip 11 and an open butt end 12. The tip end of the barrel is formed with a plurality clutch fingers 13. Mounted over the tip 11 is a conical sleeve 14. This sleeve 14 is formed with an outer knurled portion 15 at its enlarged open end around the outer bore thereof. Each divided base of each of the clutch fingers 13 is formed with blisters or small humps 16. These coact with the interior surfaces of indentations 17 formed in the internal bore at the base of the

2

conical sleeve 14 to compress the free ends of the fingers 13 into gripping engagement with a piece of lead when projecting in writing position from the tip of the sleeve 14. The turning of the sleeve 14 thus serves to contract or squeeze together the clutch fingers 13 formed in the tip portion of the barrel 10 for the purpose of gripping lead which has been projected to writing position, by the lead carrier or pick-up clutch to be hereinafter described.

The barrel 10 may be made of any suitable material, such as synthetic plastic resin compounds and is preferably either transparent or translucent to add to the attractive appearance of the pencil. The transparent barrel has an additional advantage in that this facilitates location of the leads and several parts of the pencil in case of possible misuse or breakage.

The barrel 10 is formed longitudinally with an elongated slot 18 from the butt end 12. The purpose of the slot 18 is to receive a portion of a member, such as a specially shaped and proportioned lug 19. The body of the lug 19 extends transverse the barrel and is formed with an index head 19^a, which head is exterior of the barrel and a part of a reduced or neck portion 19^b, see Fig. 4.

The neck portion 19^b is bounded on each side by the walls of the slot 18 and continues to a pair of shoulders 19^c and 19^d positioned just within the bore of the barrel 10. Thus the lug 19 is slidably supported in the barrel on each side of the slot 18 and extends toward a diametrically opposite interior side. This end of the lug 19 is hereinafter termsd the cam end 19^e. The lug 19 is formed with an opening extending in a direction substantially parallel with the slot 18. This opening is centered with respect to the barrel bore to serve as the pivot point for the clutch shaft 20 with the non-axially centered clutch 21. Through this opening extends the tail end of the elongated shaft 20. This shaft is journalled in friction bearings 22 and 23 mounted on each side of the lug 19 and from the bearing toward the pencil point the shaft 20 is slightly bent to thereby non-axially center a lead pick-up clutch 21 for proper keying with the radially arranged lead channels. The shaft 20 at the other end is formed with an inverted split conical head 24. Obviously, as the shaft 20 is non-axially positioned with respect to the axis of the interior of the pencil barrel, the clutch 21 is likewise thus positioned and when revolved will follow circular path over the several lead channels hereinafter described.

The halves of the conical head 24 are of spring material normally biased apart by the inherent spring-like qualities of the material. Mounted over the rim of the open butt end 12 of the barrel 10 is a lead selector cap 27, see Figs. 1 and 3, formed flat on the exterior face or top portion and with a countersunk star wheel 28, which may have eight points, on its interior face or bottom portion, see Figs. 1 and 3. An annular land 29 surrounds the base of the star wheel 28, which in turn is surrounded by an annular groove 30 into which fits the rim of the butt end 12, so that the exterior annular flange 31 of the cap 27 encircles the upper cylindrical part of the barrel 10 and serves as a bearing sleeve to permit rotation of the cap 27 on the barrel. The barrel 10 has fixed within it a lead magazine 33 with a plurality of radially arranged lead holding channels, one for each notch in the star wheel 28, see Fig. 6.

The center of the star wheel 28 is formed with a conical socket 32 into which snap fits the inverted conical head 24 when the lug 19 is moved to the top of slot 18 toward the cap 27. This snap connection between the head 24 and the socket 32 when coupled provides for rotation of the clutch shaft 20 upon rotation of the cap 27 with the star wheel 28. Turning the cap 27 and the pointer of the cap to any one of the numbers 1 to 8 in the barrel results in positioning the clutch 21 over one of the lead channels for selection of a particular lead in the lead magazine.

As previously stated, the lug 19 is slidable in the slot 18 and non-axially centers the clutch end of the clutch shaft 20, while the upper end is rotatable in the lug opening in the friction bearings 22 and 23. These bearings are secured on each side of the lug 19 at the shaft opening and serve to prevent longitudinal displacement of the shaft 20 with respect to the lug body as it is moved longitudinally in slot 18 and causes the shaft 20 to follow the longitudinal movement of the lug 19 when the head 24 becomes disconnected from the cap 27, which cap becomes instantly locked upon such disconnection by a latch now to be described. Also when the shaft 20 disconnected from the cap it is held against rotation by the frictional resistance of bearings 22 and 23.

On the inside of the barrel 10 is a flat leaf spring 34 with the base end thereof secured by rivets 35 to the barrel wall. The other end of the spring is free and formed with a dog or an enlarged wedge-shaped catch 37 adapted to interfit between the notches of each star point on the star wheel 28. This spring is bowed to strongly bias it to latching action until released by lug 19. Release by lug 19 permits rotation of the cap 27 with respect to barrel 10. The pointer 27a on the cap 27 is for the purpose of pointing to a lead number on the barrel butt end 12, to thereby select an individual lead in the lead magazine 33 as the cap 27 is turned. The non-axially positioned clutch 21 when its shaft 20 is disconnected from the cap 27 is frictionally held against further rotation by friction bearings 22 and 23 and when moved forward with the lug 19 will pick up a selected head in the barrel carried lead magazine and carry it on to writing position in the barrel tip 11.

The spring 34 extends between the interior side of the barrel 10 and the cam end 19e of the lug 19. Therefore when the lug 19 is uppermost in slot 18 and the split head 24 on the end of shaft 20 is in the star wheel socket 32, the dog or wedge-

shaped catch 37 is held out of engagement with the star wheel 28 as shown in Fig. 1. This permits the cap 27 to be rotated for lead selection by positioning pointer 27a on the cap 27 opposite a lead channel number.

After selection of the lead by its indicating number start of movement of the lug 19 down the slot 18 disconnects the clutch shaft from socket 32 and promptly removes the pressure of the cam end 19e from the flat spring 34 and the dog or wedge catch 37 is spring biased into a notch of the star wheel 28 corresponding to the selected lead number and corresponding lead channel and locks the cap 27, the non-axial section of shaft 20 and the clutch 21 being frictionally held against rotation from the lead selected position by the frictional resistance of the friction bearings 22 and 23 of lug 19.

The remaining parts of this device comprise a ring 33a formed with inner projections 39. The ring is fixed in the barrel 10 between the lug 19 and the top of the lead magazine 33 likewise fixed in the barrel. These projections 39 overlap the lead chambers 40 and their respective lead holding spring liners 41. These projections 39 serve to spread apart the jaws of the aligned clutch 21 on the forward movement thereof toward one of the lead magazine channels, see Fig. 6, while on lead return or retracting movement of the clutch these projections serve to rake out the lead from between the jaws. Also, the clutch 21 after being turned in lead channel alignment and on forward movement into one of the radially arranged lead channels will spread apart its spring liner and pick up the lead selected.

Thus there is provided a magazine pencil structure comprised of very few parts, whereby economy in manufacture and durability of the manufactured products are paramount. All that is necessary to operate the pencil is to turn the cap 27 with the clutch shaft coupled to the star wheel socket so as to swing the non-axially centered clutch over the lead magazine fixed therein, until the cap pointer 27a is opposite or adjacent a selected lead number to align the clutch with a selected lead channel. Then movement of the lug 19 down the slot 18 disconnects the star wheel from the clutch shaft and releases the spring 34 to spring bias the dog or wedge 37 into a star wheel notch for locking the wheel to a selected lead number, while the frictional resistance of bearings 22 and 23 hold the clutch in set position.

Continued forward movement of the lug 19 causes the clutch 21 due to its slight non-axial position in the pencil barrel and alignment with the selected channel to pick up the lead from its aligned channel and carry on to writing position in the tip 11. The lead is then held in writing position by the adjustment of the conical sleeve 14, which compresses the fingers 13 into lead gripping action.

Without further description it is thought that others skilled in this art should be able to clearly understand the same; and it is to be expressly understood that various changes in the arrangement and combination of the parts illustrated, as will now be apparent to others, are intended to be a part hereof. To determine the scope of the invention reference should be had to the appended claim.

What is claimed is:

A magazine lead pencil having a hollow barrel formed with a writing tip and an open butt end, a lead magazine formed with radial lead channels in the barrel, an elongated slot formed lon-

gitudinally in the wall of the barrel from the said butt end, a member slidably mounted in the barrel formed with an opening therethrough the axis thereof being positioned parallel with respect to the axis of the barrel bore and extending substantially parallel to the axis of the slot, a shaft journalled in the said opening to rotate in the said member, said shaft at one end being non-axially centered with respect to the axis of the barrel bore, friction bearing means mounted on the said slidable member on each side of the opening preventing longitudinal movement of the shaft with respect to the said member so they move together along the barrel slot axis, a cam end on the slidable member inside the barrel, a lead gripping clutch non-axially mounted on the non-axially positioned end of the shaft, a quickly detachable joint coupling head on the opposite end of said shaft, a cap rotatably mounted on the rim of said butt end adapted to couple with the said clutch shaft coupling head, a star wheel carried inside the cap, a socket formed at the axis of the star wheel into which said coupling head couples and is adapted to snap when the said member is moved upward in the slot toward the cap, and a spring latch normally urged toward the star wheel to lock and unlock the cap against rotation with respect to the barrel, said

slidable member with said cam end being movable to and from a position overlying and contacting the spring latch alternatively to cam the spring latch from the star wheel or to permit engagement between said latch and said wheel, thereby permitting rotation of the cap and the non-axially positioned end of the shaft with the non-axially centered lead gripping clutch for selective circular positioning of the said non-axially centered clutch in line with a radial lead channel in the lead magazine.

SAMUEL B. HARRIS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
876,223	Newmann et al.	Jan. 7, 1908
1,516,392	Mabee	Nov. 18, 1924
1,567,738	Knight	Dec. 29, 1925
1,849,997	Angeletti	Mar. 15, 1932
1,964,154	Hertz	June 26, 1934

FOREIGN PATENTS

Number	Country	Date
14,277	Great Britain	of 1909